What is claimed is:

1. A workpiece coordinate system origin setting method of a surface texture measuring machine, the method comprising:

an input step for inputting data obtained by scanning over a feature area including at least a feature point area and a non-feature point area of a workpiece surface with a detector of the surface texture measuring machine for measuring surface texture by scanning over a workpiece surface;

a feature point selection step for extracting the coordinate values of feature points of the data by statistically processing the data obtained in the input step; and

an origin setting step for setting the origin of a workpiece coordinate system relative to an origin setting target point of the workpiece based on the coordinate values of the feature points obtained in the feature point selection step.

2. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 1, wherein

the data inputted in the input step are machine coordinate system data determined uniquely by the surface texture measuring machine.

3. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 1, wherein

the input step includes a predetermined area removing step for removing data of predetermined areas not necessary for the statistical processing in the feature point selection step, from the inputted data.

4. The workpiece coordinate system origin setting method of a surface texture

measuring machine according to claim 1, wherein

the input step includes a singular point removing step for removing singular point data protruded from the inputted data.

5. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 4, wherein

in the singular point removing step, singular point data protruded from the data is removed based on robust estimation.

6. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 1, wherein

in the feature point selection step, the coordinate values of the feature points of the data obtained in the input step are determined based on a trigger level set in advance for the data, and wherein

in the origin setting step, the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece after the coordinate values of the feature points obtained in the feature point selection step are corrected based on a correction value corresponding to the trigger level.

7. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 1, wherein

in the feature point selection step, the coordinate values of the feature points of the data obtained in the input step are determined based on a statistical reference line of data of the non-feature point area in the data.

8. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 7, wherein

in the feature point selection step, the coordinate values of the feature

points of the data are determined based on a point for which the data exceeds a predetermined trigger level determined based on the reference line, and wherein

in the origin setting step, the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece after the coordinate values of data feature points obtained in the feature point selection step are corrected based on the correction value corresponding to the magnitude of the trigger level.

9.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 8, wherein

in the feature point selection step, a reference line indicating the direction of the non-feature point areas of the workpiece surface is obtained based on the data of the non-feature point area in the data obtained in the input step, and the data exceeding a trigger level, provided in parallel to the reference line and separated by a predetermined distance in the direction perpendicular to the reference line, for determining that the stylus has moved exceeding the boundary point between the non-feature point area and the feature point area of the workpiece surface are obtained as the coordinate values of the feature points, and wherein

in the origin setting step, the coordinate values of the boundary point between the non-feature point area and the feature point area of the workpiece surface are estimated based on the coordinate values of the feature points obtained in the feature points selection step, the correction value of the stylus obtained in advance and the trigger level obtained in advance, and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the boundary point.

10.   The workpiece coordinate system origin setting method of a surface texture

measuring machine according to claim 9, wherein

when the origin of the workpiece coordinate system is set relative to an origin setting target point other than a feature point of the workpiece surface,

in the origin setting step, the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the coordinate values of the feature points obtained in the feature point selection step, the correction value of the stylus obtained in advance, the trigger level obtained in advance and the designed values of the workpiece obtained in advance.

11. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 7, wherein

in the feature point selection step, the coordinate values of the feature points of the data are determined based on the point for which the angle formed by the inclined line of each minute range of the data obtained in the input step and the reference line exceeds a predetermined angle.

12. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 11, wherein

in the feature point selection step, a reference line indicating the direction of the non-feature point area of the workpiece surface is obtained based on the data of the non-feature point area in the data obtained in the input step, the data is divided into minute ranges, the inclined line of each minute range is obtained, the angles formed by the reference line and the inclined lines are compared and the representative points of the minute ranges for which the angle has exceeded a predetermined angle are obtained as the coordinate values of the feature points of the data, and wherein

in the origin setting step, the coordinate values of the boundary point between a feature point area and a non-feature point area of the workpiece

surface are estimated based on the coordinate values of the feature points obtained in the feature point selection step and the correction value of the stylus obtained in advance, and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the boundary point.

13.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 1, wherein

in the feature point selection step, the coordinate values of the feature points of the data obtained in the input step are determined based on the rate of variation of the inclination angle of each minute range of the data.

14.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 13, wherein

in the feature point selection step, the coordinate values of the feature points of the data obtained in the input step are determined based on the minute range for which the rate of variation of the inclination angle becomes more than a predetermined value or reaches the maximum.

15.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 14, wherein

in the feature point selection step, the inclination angle of each of the minute ranges of the data obtained in the input step against the driving axis direction or the detection axis direction of the stylus is obtained, the rate of variation between the inclination angles of each minute range adjacent to each other is obtained and the representative points of the minute ranges for which the rate of variation becomes more than a predetermined value or reaches the maximum are obtained as the coordinate values of the feature points of the data,

MT0257:SPC   - 59 -

and wherein

in the origin setting step, the coordinate values of the boundary point between a non-feature point area and a feature point area of the workpiece surface are estimated based on the coordinate values of the feature point obtained in the feature point selection step and the correction value of the stylus obtained in advance and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the boundary point.

16. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 13, wherein

in the feature point selection step, the coordinate values of the feature points of the data obtained in the input step are determined based on the minute range for which the rate of variation of the inclination angle becomes less than a predetermined value or reaches the minimum.

17. The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 16, wherein

in the input step, data obtained by scanning over at least a protrusion of the workpiece surface with a stylus of a surface texture measuring machine are inputted, wherein

in the feature point selection step, the inclination angle of each of the minute ranges of the data obtained in the input step against the driving axis direction or the detection axis direction of the stylus is obtained, the rate of variation between the inclination angles of each minute range adjacent to each other is obtained and the representative points of the minute ranges for which the rate of variation becomes less than a predetermined value or reaches the minimum are obtained as the coordinate values of the feature points of the data,

and wherein

in the origin setting step, the coordinate values of the highest point of the protrusion of the workpiece surface are estimated based on the coordinate values of the feature point obtained in the feature point selection step and the correction value of the stylus obtained in advance and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the highest point of the protrusion.

18.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 16, wherein

in the input step, data obtained by scanning over at least a recess of the workpiece surface with a stylus of a surface texture measuring machine are inputted, wherein

in the feature point selection step, the inclination angle of each of the minute ranges of the data obtained in the input step against the driving axis direction or the detection axis direction of the stylus is obtained, the rate of variation between the inclination angles of each minute range adjacent to each other is obtained and the representative points of the minute ranges for which the rate of variation becomes less than a predetermined value or reaches the minimum are obtained as the coordinate values of the feature points of the data, and wherein

in the origin setting step, the coordinate values of the lowest point of the recess of the workpiece surface are estimated based on the coordinate values of the feature point obtained in the feature point selection step and the correction value of the stylus obtained in advance and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the lowest point of the recess.

19.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 1, wherein

in the feature point selection step, the coordinate values of feature points of the data obtained in the input step are determined based on the change of the sign attached to the inclination angle of each minute range of the data obtained in the input step.

20.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 19, wherein

in the input step, data obtained by scanning over at least a protrusion of the workpiece surface with a stylus of a surface texture measuring machine are inputted, wherein

in the feature point selection step, the inclination angle of each of the minute ranges of the data obtained in the input step against the driving axis direction or the detection axis direction of the stylus is obtained and the points at which the sign attached to the inclination angle changes from ascending to descending are obtained as the coordinate values of the feature points of the data, and wherein

in the origin setting step, the coordinate values of the highest point of the protrusion of the workpiece surface are estimated based on the coordinate values of the feature point obtained in the feature point selection step and the correction value of the stylus obtained in advance and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the highest point of the protrusion.

21.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 19, wherein

in the input step, data obtained by scanning over at least a recess of the

19.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 1, wherein

in the feature point selection step, the coordinate values of feature points of the data obtained in the input step are determined based on the change of the sign attached to the inclination angle of each minute range of the data obtained in the input step.

20.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 19, wherein

in the input step, data obtained by scanning over at least a protrusion of the workpiece surface with a stylus of a surface texture measuring machine are inputted, wherein

in the feature point selection step, the inclination angle of each of the minute ranges of the data obtained in the input step against the driving axis direction or the detection axis direction of the stylus is obtained and the points at which the sign attached to the inclination angle changes from ascending to descending are obtained as the coordinate values of the feature points of the data, and wherein

in the origin setting step, the coordinate values of the highest point of the protrusion of the workpiece surface are estimated based on the coordinate values of the feature point obtained in the feature point selection step and the correction value of the stylus obtained in advance and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the highest point of the protrusion.

21.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 19, wherein

in the input step, data obtained by scanning over at least a recess of the

workpiece surface with a stylus of a surface texture measuring machine are inputted, wherein

in the feature point selection step, the inclination angle of each of the minute ranges of the data obtained in the input step against the driving axis direction or the detection axis direction of the stylus is obtained and the points at which the sign attached to the inclination angle changes from descending to ascending are obtained as the coordinate values of the feature points of the data, and wherein

in the origin setting step, the coordinate values of the lowest point of the recess of the workpiece surface are estimated based on the coordinate values of the feature point obtained in the feature point selection step and the correction value of the stylus obtained in advance and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the lowest point of the recess.

22.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 1, wherein

in the feature point selection step, the coordinate values of the feature points of the data are determined based on the maximum or the minimum of the data obtained in the input step.

23.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 22, wherein

in the input step, data obtained by scanning over at least a protrusion of the workpiece surface with a stylus of a surface texture measuring machine are inputted, wherein

in the feature point selection step, the coordinate values of the feature point which is the maximum of the data obtained in the input step are obtained,

and wherein

in the origin setting step, the coordinate values of the highest point of the protrusion of the workpiece surface are estimated based on the coordinate values of the feature point obtained in the feature point selection step and on the correction value of the stylus obtained in advance and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the highest point of the protrusion.

24.   The workpiece coordinate system origin setting method of a surface texture measuring machine according to claim 22, wherein

in the input step, data obtained by scanning over at least a recess of the workpiece surface with a stylus of a surface texture measuring machine are inputted, wherein

in the feature point selection step, the coordinate values of the feature point which is the minimum of the data obtained in the input step are obtained, and wherein

in the origin setting step, the coordinate values of the lowest point of the recess of the workpiece surface are estimated based on the coordinate values of the feature point obtained in the feature point selection step and the correction value of the stylus obtained in advance and the origin of the workpiece coordinate system is set relative to the origin setting target point of the workpiece based on the estimated coordinate values of the lowest point of the recess.

25.   A workpiece coordinate system origin setting program of a surface texture measuring machine, wherein

the program causes a computer to execute a workpiece coordinate system origin setting method of a surface texture measuring machine according to claim

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26.   A workpiece coordinate system origin setting device of a surface texture measuring machine, wherein the device comprises:

a data inputter for inputting data obtained by scanning a feature area including at least a feature point area and a non-feature point area of the surface of a workpiece with a detector of a surface texture measuring machine measuring surface texture by scanning the surface of the workpiece;

a feature point selector for extracting the coordinate values of feature points of the data by statistically processing the data inputted into the data inputter; and

an origin setter for setting the origin of a workpiece coordinate system relative to an origin setting target point of the workpiece based on the coordinate values of the feature point obtained by the feature point selector.